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SCANS

WHAT WORK REQUIRES OF SCHOOLS

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A SCANS REPORT FOR AMERICA 2000

EXECUTIVE SUMMARY

THE SECRETARY'S COMMISSION ON ACHIEVING NECESSARY SKILLS
U.S. DEPARTMENT OF LABOR

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EXECUTIVE SUMMARY

The Secretary's Commission on Achieving Necessary Skills (SCANS) was asked to examine the demands of the workplace and whether our young people are capable of meeting those demands.

Specifically, the Commission was directed to advise the Secretary on the level of skills required to enter employment. In carrying out this charge, the Commission was asked to:

- Define the skills needed for employment;
- Propose acceptable levels of proficiency;
- Suggest effective ways to assess proficiency; and
- Develop a dissemination strategy for the nation's schools, businesses, and homes.

This report results from our discussions and meetings with business owners, public employers, unions, and workers and supervisors in shops, plants, and stores. It builds on the work of six special panels we established to examine all manner of jobs from manufacturing to government employment. We also commissioned researchers to conduct lengthy interviews with workers in a wide range of jobs.

The message to us was universal: good jobs will increasingly depend on people who can put knowledge to work. What we found was disturbing: more than half our young people leave school without the knowledge or foundation required to find and hold a good job. These young people will pay a very high price. They face the bleak prospects of dead-end work interrupted only by periods of unemployment.

Two conditions that arose in the last quarter of the 20th Century have changed the terms for our young people's entry into the world of work: the globalization of commerce and industry and the explosive growth of technology on the job.

These developments have barely been reflected in how we prepare young people for work or in how many of our workplaces are organized. Schools need to do a better job and so do employers. Students and workers must work smarter. Unless they do, neither our schools, our students, nor our businesses can prosper.

SCANS research verifies that what we call *workplace know-how* defines effective job performance today. This know-how has two elements: *competencies* and a *foundation*. This report identifies five competencies (See insert below.) and a three-part foundation of skills and personal qualities (See pages 4 and 5.) that lie at the heart of job-performance. These eight requirements are essential preparation for all students, both those going directly to work and those planning further education. Thus, the competencies and the foun-

FIVE COMPETENCIES

Resources: Identifies, organizes, plans, and allocates resources

A. *Time*—Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules

B. *Money*—Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives

C. *Material and Facilities*—Acquires, stores, allocates, and uses materials or space efficiently

D. *Human Resources*—Assesses skills and distributes work accordingly, evaluates performance and provides feedback

Interpersonal: Works with others

A. *Participates as Member of a Team*—contributes to group effort

B. *Teaches Others New Skills*

C. *Serves Clients/Customers*—works to satisfy customers' expectations

D. *Exercises Leadership*—communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies

E. *Negotiates*—works toward agreements involving exchange of resources, resolves divergent interests

F. *Works with Diversity*—works well with men and women from diverse backgrounds

Information: Acquires and uses information

A. *Acquires and Evaluates Information*

B. *Organizes and Maintains Information*

C. *Interprets and Communicates Information*

D. *Uses Computers to Process Information*

Systems: Understands complex interrelationships

A. *Understands Systems*—knows how social, organizational, and technological systems work and operates effectively with them

B. *Monitors and Corrects Performance*—distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions

C. *Improves or Designs Systems*—suggests modifications to existing systems and develops new or alternative systems to improve performance

Technology: Works with a variety of technologies

A. *Selects Technology*—chooses procedures, tools or equipment including computers and related technologies

B. *Applies Technology to Task*—Understands overall intent and proper procedures for setup and operation of equipment

C. *Maintains and Troubleshoots Equipment*—Prevents, identifies, or solves problems with equipment, including computers and other technologies

dation should be taught and understood in an integrated fashion that reflects the workplace *contexts* in which they are applied.

We believe, after examining the findings of cognitive science, that the most effective way of learning skills is "in context," placing learning objectives within a real environment rather than insisting that students first learn in the abstract what they will be expected to apply.

A THREE-PART FOUNDATION

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks

A. *Reading*—locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules

B. *Writing*—communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts

C. *Arithmetic/Mathematics*—performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques

D. *Listening*—receives, attends to, interprets, and responds to verbal messages and other cues

E. *Speaking*—organizes ideas and communicates orally

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons

A. *Creative Thinking*—generates new ideas

B. *Decision Making*—specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative

C. *Problem Solving*—recognizes problems and devises and implements plan of action

D. *Seeing Things in the Mind's Eye*—organizes, and processes symbols, pictures, graphs, objects, and other information

E. *Knowing How to Learn*—uses efficient learning techniques to acquire and apply new knowledge and skills

F. *Rea :ing*—discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty

A. *Responsibility*—exerts a high level of effort and perseveres towards goal attainment

B. *Self-Esteem*—believes in own self-worth and maintains a positive view of self

C. *Sociability*—demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings

D. *Self-Management*—assesses self accurately, sets personal goals, monitors progress, and exhibits self-control

E. *Integrity/Honesty*—chooses ethical courses of action

The five SCANS competencies span the chasm between the worlds of the school and the workplace. Because they are needed in workplaces dedicated to excellence, they are the hallmark of today's expert worker. And they lie behind every product and service offered on today's market.

The competencies differ from a person's technical knowledge. For example, both accountants and engineers manage resources, information,

systems, and technology. They require competence in these areas even though building a bridge has little to do with balancing a set of books. But in each profession, the competencies are at least as important as technical expertise. The members of the Commission believe these competencies are applicable from the shop floor to the executive suite. In the broadest sense, the competencies represent the attributes that today's high-performance employer seeks in tomorrow's employee.

To describe how this know-how is used on the job, our report provides a series of five scenarios that portray work requirements in the context of the real world. The scenarios show that work involves a complex interplay among the five competencies we have identified and the three elements of the foundation—the **basic skills**, higher order **thinking skills**, and diligent application of **personal qualities**.

The scenarios make clear that tomorrow's career ladders require even the basic skills—the old 3 Rs—to take on a new meaning. First, all employees will have to **read** well enough to understand and interpret diagrams, directories, correspondence, manuals, records, charts, graphs, tables, and specifications. Without the ability to read a diverse set of materials, workers cannot locate the descriptive and quantitative information needed to make decisions or to recommend courses of action. What do these reading requirements mean on the job? They might involve:

- interpreting blueprints and materials catalogues;
- dealing with letters and written policy on complaints;
- reading patients' medical records and medication instructions; and
- reading the text of technical manuals from equipment vendors.

At the same time, most jobs will call for **writing skills** to prepare correspondence, instructions, charts, graphs, and proposals, in order to

make requests, explain, illustrate, and convince. On the job this might require:

- writing memoranda to justify resources or explain plans;
- preparing instructions for operating simple machines;
- developing a narrative to explain graphs or tables; and
- drafting suggested modifications in company procedures.

Mathematics and **computational skills** will also be essential. Virtually all employees will be required to maintain records, estimate results, use spreadsheets, or apply statistical process controls as they negotiate, identify trends, or suggest new courses of action. Most of us will not leave our mathematics behind us in school. Instead, we will find ourselves using it on the job, for example, to:

- reconcile differences between inventory and financial records;
- estimate discounts on the spot while negotiating sales;
- use spreadsheet programs to monitor expenditures;
- employ statistical process control procedures to check quality; and
- project resource needs over the next planning period.

Finally, very few of us will work totally by ourselves. More and more, work involves listening carefully to clients and co-workers and clearly articulating one's own point of view. Today's worker has to **listen** and **speak** well enough to explain schedules and procedures, communicate with customers, work in teams, understand customer concerns, describe complex systems and procedures, probe for hidden meanings, teach others, and solve problems. On the job, these skills may translate readily into:

- training new workers or explaining new schedules to a work team;

- describing plans to supervisors or clients;
- questioning customers to diagnose malfunctions; and
- answering questions from customers about post-sales service.

SCANS estimates that less than half of all young adults have achieved these reading and writing minimums; even fewer can handle the mathematics; and, schools today only indirectly address listening and speaking skills.

Defining the minimum levels of proficiency in the SCANS competencies is also a crucial part of the Commission's task. It requires judgments about the learning possible in yet-to-be designed schools. It also requires imagining what the workplaces of the year 2000 could and should look like.

Our work on these required levels of proficiency is not complete. We have examined less than a third of the jobs we intend to research. We also wish to hear what others think of our initial efforts. The insert on page 9 is illustrative of our initial estimates of work-ready levels of proficiency in the five competencies. Proficiency in each competency requires proficiency in the foundation. The contexts displayed come from more extensive scenarios contained in our report. The point we wish to make is that young people leaving school should have both a sufficient foundation and level of understanding of the competencies to exhibit performances like those illustrated.

The minimums we propose will define what makes a young person ready for work at entry levels on career ladders. They represent neither the first nor last step in a process of life-long learning. Instead, the minimums will be a second step in a progression of skills acquisition. For example, consider scheduling time, part of the SCANS **resources** competency. A young student (at the preparatory stage) might be expected

KNOW-HOW:
WORK-READY LEVEL OF PROFICIENCY

Competence	Example of Level
Resources	Develop cost estimates and write proposals to justify the expense of replacing kitchen equipment. Develop schedule for equipment delivery to avoid closing restaurant. Read construction blueprints and manufacturers' installation requirements to place and install equipment in the kitchen.*
Interpersonal	Participate in team training and problem-solving session with multicultural staff of waiters and waitresses. Focus on upcoming Saturday night when local club has reserved restaurant after midnight for party. Three people cannot work and team has to address the staffing problem and prepare for handling possible complaints about prices, food quality, or service.*
Information	Analyze statistical control charts to monitor error rate. Develop, with other team members, a way to bring performance in production line up to that of best practice in competing plants.**
Systems	As part of information analysis above, analyze painting system and suggest how improvements can be made to minimize system downtime and improve paint finish.**
Technology	Evaluate three new paint spray guns from the point of view of costs, health and safety, and speed. Vendors describe performance with charts and written specifications. Call vendors' representatives to clarify claims and seek the names of others using their equipment. Call and interview references before preparing a report on the spray guns and making a presentation to management.**

*Competence as demonstrated in a service sector application.
**Competence as demonstrated in a manufacturing sector application.

to make a schedule for him or herself. Being *work-ready* would require making a schedule for others. At the extreme, a specialist might develop schedules for an airline. (See insert below.)

PROGRESS IN ACQUIRING SKILLS

Proficiency Level	Performance Benchmark
Preparatory	Scheduling oneself
Work-Ready	Scheduling small work team
Intermediate	Scheduling a production line or substantial construction project
Advanced	Developing roll-out schedule for new product or production plant
Specialist	Develop algorithm for scheduling airline

In September 1989 President Bush and the nation's governors agreed to six national goals in education to be achieved by the year 2000. By April 1991 a four-part strategy to attain these six goals was announced by President Bush and Secretary of Education Lamar Alexander. This report of the Secretary of Labor's Commission on Achieving Necessary Skills speaks directly to those goals and to that strategy. It defines what our young people must know and be able to do in order to hold a decent job and earn a decent living.

Our work pertains directly to National Goals #3 and #5 which state:

Goal #3 American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and *productive employment in our modern economy.* (emphasis added)

Goal #5 Every adult American will be literate and will *possess the knowledge and skills necessary to compete in a global economy* and exercise the rights and responsibilities of citizenship. (emphasis added)

Our report is intended to contribute to all four parts of the strategy put forth by President Bush in AMERICA 2000 as shown below.

EXCERPTS FROM AMERICA 2000's FOUR-PART STRATEGY[1]

Part 1.

"For Today's Students: Better and More Accountable Schools—World Class Standards:. . . . These standards will incorporate both knowledge and skills, to ensure that, when they leave school, young Americans are prepared for further study and the work force."

Part 2.

"For Tomorrow's Students: A New Generation of American Schools. New American Schools: help communities create schools that will reach the national education goals, including World Class Standards."

Part 3.

"For the Rest of Us (Yesterday's Students/ Today's Work Force): A Nation of Students— Private-Sector Skills and Standards: Business and labor will be asked... to establish job-related skill standards, built around core proficiencies...."

Part 4.

"Communities Where Learning Can Happen." AMERICA 2000 Communities. The president is challenging every city, town, and neighborhood... to adopt the six national education goals... [and] develop a report card for measuring progress."

[1]The White House, April 18, 1991.

Workforce know-how will be part of the new World Class Standards. However, defining competencies and a foundation is not enough. Schools must teach them. Students must learn them. And, they should be assessed as part of the AMERICA 2000 agenda. Our work on these issues will continue over the coming months. Among the concrete steps SCANS will take in the future are efforts to:

- examine how to create an assessment system that helps students understand what they have to learn and certifies that they have mastered the competencies so that employers and colleges will honor their record of high school performance;
- consider the implications of the SCANS findings for curriculum development, school organization, teacher training, and instructional materials and technology; and
- help the Administration establish the public-private partnership called for in the education strategy, "AMERICA 2000."

The President of the United States has encouraged all of us to become revolutionaries in the cause of education. For over 200 years Americans have worked to make education part of their national vision, indispensable to democracy and to individual freedom. For at least the last 40 years, we have worked to further the ideal of equity—for minority Americans, for the disabled, and for immigrants. With that work still incomplete, we are called to still another revolution—to create an entire people trained to think and equipped with the know-how to make their knowledge productive.

This new revolution is no less exciting or challenging than those we have already completed. Nor is its outcome more certain. All that is certain is that we must begin.

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